

### Evolution, revolution, or obsolescence: an examination of writings on the future of health sciences libraries

DOI: <http://dx.doi.org/10.3163/1536-5050.100.1.003>

Health sciences libraries are facing enormous challenges. While there is significant national interest in the management of health information, institutions and, concomitantly, funding are focusing on aspects of the management of information and data that falls more readily under the domain of biomedical informaticians than librarians. While learning organizations need more knowledge management (KM), something that certainly falls into the natural domain of health sciences librarians, until recently, few librarians have embraced the new roles associated with KM. For context, comparing the means of both the materials and the personnel budgets found in the 2005–2006 [1] and 2009–2010 [2] Association of Academic Health Sciences Libraries (AAHSL) *Annual Statistics of Medical School Libraries in the United States and Canada*, the percentage increase in expenditures for materials was 9.0% total over the 5 years, far below the increase in cost for health sciences resources during the same period, based on past trends [3]. The percentage increase in expenditures on personnel over the same period was an average of only 1.2% per year, suggesting a possible loss of full-time equivalent employees over the 5-year period.

At the beginning of the new century, between 2000 and 2005, a number of articles were published in the professional literature describing innovative new roles and competencies for health sciences librarians of the future that would move the profession into a greater position of viability. However, since 2006, there has been a paucity of literature about librarians who have embraced these new roles, and, with the exception of discussions on social networking sites and other commentaries available on the web, the movement toward

ensuring our place in the future of knowledge management is slow, if it exists.

A brief communication, "Tomorrow's Academic Health Sciences Libraries Today," included in this issue of the *Journal of the Medical Library Association (JMLA)* as a companion to this comment and opinion piece, presents the results of a survey and semi-structured interviews that establish the directions current academic health sciences libraries are taking to achieve these ends [4]. Literature focusing on the vision for health sciences librarians of the future and the skills necessary to meet that vision is briefly summarized here and compared with comments about future competencies of health sciences librarians disseminated through the web. These observations provide a basis for recommendations to move our profession into a position of strength in the current economic climate and health care environment.

#### The peer-reviewed literature

In 2000, a seminal article was published in the *Annals of Internal Medicine* introducing a new "profession" called the informationist [5]. These new professionals were a hybrid of medical librarians and clinicians modeled on the hospitalist, with a deep content knowledge of medicine and a working knowledge of the data and knowledge-bases required to access evidence to support decision making. While clinical medical librarianship had been an accepted activity in hospitals for almost four decades since it was first introduced by Lamb [6], there were few such programs and their effectiveness was not uniform. The Davidoff and Florance article stimulated a rethinking of the profession and challenged the comfort level of many health sciences librarians who felt that their training was sufficient to serve in these new roles.

Two years later, because of the excitement generated by the concept, an informationist conference was held at the National Library of Medicine and hosted by the Medical Library Association (MLA). The purpose of the conference was to examine the need for such a professional in both clinical and research settings, to define the competencies for both clinical and research informationists, and to develop funding models to support these professionals. Findings of the conference included the benefits that would come from employing such new professionals, the necessity for dual degrees or advanced training with content expertise, and the realization that a different funding model would be required to ensure that these advanced practice information specialists were appropriately compensated [7]. The conference also developed a more defined and enhanced model for the liaison with a doctoral (PhD) and master's of library science (MLS) degrees in the research arena and put forward an active clinical informationist program in which librarians' content expertise provides decision support in hospitals and evidence-based education for health professionals' training.

Three subsequent articles, published the same year, presented a variety of different informationist models [8–10]. One institution, Vanderbilt University, took the clinical informationist to its fullest potential, with thorough training in evidence-based practice and active participation on the patient care team [11]. However, a 2008 systematic review article showed little adoption of the concept, with the primary barriers being lack of qualified candidates, formal training programs to develop informationists, and compensation to award higher education levels or dual degrees [12].

Another article published in 2002 looked at ways that MLA

could promote new roles and new competencies for health sciences librarians. The authors explored areas that were particularly suited to knowledge managers and that provided enhanced value to their parent institutions. Among the identified areas were information interventions as part of proteomics initiatives, web portals providing access to quality-filtered and critically analyzed information to improve health literacy, and knowledge linked to electronic health records (EHRs) to support clinical decision making at the point of care. Librarians in these new roles were envisioned as information architects, evidence educators, knowledge engineers, and decision-support specialists [13]. Some of these same competency-based roles were enumerated three years later by Kronenfeld as an outcome of a David A. Kronick Traveling Fellowship to explore future trends in academic health sciences libraries [14].

However, in reviewing MLA's website and the *Competencies for Lifeline Learning and Professional Success*, most of the specifics of the listed competencies relate to updating skills required to maintain traditional medical library values in a technology-rich environment rather than those skills essential to new roles in an academic health center or hospital [15]. Even a 2011 published report coming out of a symposium focusing on the question of the role of the library in the twenty-first century and cosponsored by the National Library of Medicine and AAHSL failed to address skills needed beyond the next decade—specifically those skills such as designing systems to capture tacit knowledge, quality filtering, linking evidence into EHRs, and so on—skills required by the knowledge manager of the future to ensure success [16].

In a 2005 *New England Journal of Medicine* article, Lindberg and Humphreys offered their view of medical libraries in the next decade. They noted several trends, including moving to ubiquitous, unlimited access to electronic in-

formation while continuing to value the library as a place. They posited that, in academic medicine, new knowledge professionals will be members of the health care team or part of a research group, creating and mining biomedical informatics databases and teaching evidence-based medicine courses. These enhanced roles will require additional training, and many knowledge professionals will have additional master's or doctoral degrees in relevant subject areas. While this article focused on the future, the authors recognized that many of these concepts were already beginning to be implemented in medical libraries across the country [17].

A perspective article written by Lee in the same issue lamented the pressures put on the traditional library to give up space and recognized the need for a reengineered view of libraries that could meet the challenges of training new physicians in an era in which the required knowledgebase has become too large for any medical student to learn [18]. Both the Lindberg and the Lee articles discussed the importance of the library as a physical space. However, in academic health sciences libraries, downsizing has become common place, not just because of the advent of electronic journals, but also because of the growing need for new learning and research space. A series of papers published in 2010 discussed the decisions and processes that led to space reduction in academic health sciences libraries across the country [19–24]. However, none of these recent articles discuss innovative roles made possible by reengineering of physical space, such as embedding the knowledge manager in interdisciplinary programs such as the Clinical and Translational Science Award (CTSA) research, where creating knowledge tools for curation and dissemination of translational knowledge is a requirement.

While few articles published since 2002 have reported dramatic changes in health sciences library roles and the requisite competen-

cies beyond those few institutions involved in clinical informationist programs, several addressed innovation in the other two pillars of academic health sciences, education and research. In education, librarians have been challenged to create new learning tools using Web 2.0 technologies, provide instruction as part of the clinical team, contribute to continuing medical education programs, train health care professionals in cultural competencies, and become virtual educators [25]. Core educational competencies required for these new roles include knowledge of health care concepts, vocabulary, and the practice of health care; technical knowledge of relevant learning environments and information systems; knowledge of teaching methods, curricular design, and assessment; and knowledge of electronic learning environments [26].

Research also offers unique opportunities for health sciences librarians, but participation in the research enterprise also often requires additional credentialing such as dual master's degrees or a doctorate plus an MLS. Bioinformatics is one area that has been particularly active in using librarians as key members of the research team [27, 28]. Liaison activities offer another bridge between the activities of the traditional academic health sciences library and new roles and opportunities, with multiple levels of involvement possible for the liaison librarian [29, 30]. However, as indicated by the findings in the brief communication in this issue [4], even though more and more health sciences libraries have formal roles in the curricula and are adopting liaison programs, these roles fall far short of the innovation suggested in the articles reviewed above.

## Web-based commentary

Virtually all of the more recent discussions about the future of medical libraries and, concomitantly, medical librarians have taken place not in peer-reviewed

literature, but in cyberspace, both in the gray literature and on blogs and other forms of social networking. All have involved the use of advanced technologies and the roles of libraries in harnessing these technologies to serve their institutions and the global community. A paper given at a 2005 conference in Prague, "The Medical Library of the Future: Be Prepared for the Invisible," focused on electronic resources and the need to move to providing information electronically through mobile libraries. The library becomes the user's home page, and the "Ubiquitous Library" becomes one available anywhere, anytime, with resources from anyplace, accessed on any device [31]. This concept radically changes the idea of the librarian associated with a physical library and requires a rethinking of the role of the librarian in the curation and dissemination of knowledge.

Several blogs have explored the emerging roles of medical librarians and have not only used Web 2.0 social networking software to communicate ideas but have suggested that it is one of the most valuable tools and that use of it is one of the most important competencies for the new librarian. These tools will fundamentally change the way librarians communicate with their clients and will promote critical management of knowledge, regardless of its source [32–34].

Health sciences librarians have been strong proponents of open source publications, so it seems fitting that an article published in the open source and online *Library Student Journal* explores the issue of the relevancy of medical libraries in an age of digital information. The author feels that creative uses of technology should serve as a foundation for future growth, with librarians as technology leaders and partners in an information-rich health care environment, librarians as third-party counselors, and librarians as information intermediaries between health care providers and patients in improving health literacy. By using Web 2.0 and social networking as infra-

structure in such initiatives, the library can become a knowledge center that goes well beyond the physical boundaries of the library [35].

A decade earlier, in 2001, Colaiani, a pioneer in medical library innovation, suggested that knowledge management—including knowledge discovery, organization, and sharing—was an evolution in the role of the traditional health sciences librarian. By expanding the traditional concept of knowledge from that contained in peer-reviewed literature to that stored in computers across the world and even located in the organization served by the library, the new librarian would not be bound by the traditional library and its collections but become a knowledge expert, seeking, organizing, and disseminating relevant knowledge as a dynamic partner in a learning organization [36].

## Conclusions

While the peer-reviewed literature during the first half of the last decade recognized the need for health sciences libraries to change and identified competencies for librarians to be able to ensure viability in the challenging health care environment, few articles were published after 2005 about these issues. However, based on the AAHSL statistics cited in the first paragraph, the need has never been greater to understand and adopt new directions for knowledge service and discovery.

There are many opportunities now and in the future, but we, as health sciences librarians, need to accept that roles must evolve. The clinical informationist has opened new venues for the value proposition in health care, but in most smaller health care organizations, employing such an individual is cost prohibitive. However, health sciences librarians can find new ways of delivering evidence at the point of care to these organizations through linking evidence-based decision support utilities to EHR systems. Partnerships with clinical

informaticians to develop such utilities, whether in academia or private industry, will improve the quality of care, enhance patient safety, and reduce health care costs.

The CTSAs in a number of universities have opened new needs for specialized knowledge management services. Translation science is based on interdisciplinary research, a melding of the basic sciences with the clinical. Capturing and curating tacit knowledge can result in new research and new knowledge generation, placing health sciences librarians at the beginning and at the end of the translational process. If the librarian is also a research informationist embedded into a basic science department, data mining knowledgebases and serving as a trusted intermediary between global knowledge and the individual researcher, then the knowledge manager becomes an integral and essential part of the translational research team.

These are only a few of the new directions that are open to health sciences librarians who embrace the challenges and are willing to develop new competencies. MLA and AAHSL need to take a proactive position in identifying and defining competencies for the future. Library schools need to partner with other schools to offer dual degree master's programs, particularly those in computer sciences and health care. Librarians need to seek and obtain certificates in medical informatics offered by institutions with recognized medical informatics programs. Goal-oriented academic health sciences librarians need to seriously consider pursuing a doctorate or a health professions degree as a basic step in achieving full collegiality with other health sciences faculty.

Health sciences libraries continue to face growing pressures in their organizations; however, the social networking sites have shown even more ways in which health sciences librarians can become highly valued professionals in the health care environment. Regardless of whether the impetus

comes from peer-reviewed literature or the web, there is general agreement that health sciences libraries must change to ensure their continued viability. It is up to libraries whether that change will come through evolution or revolution or whether complacency will mean forced obsolescence.

*Julie J. McGowan, PhD, MA, MLS, AHIP, FMLA, FACMI,  
jjmcgowa@iupui.edu,  
Professor and Chair Emeritus,  
Department of Knowledge Informatics  
and Translation; Director Emeritus,  
Ruth Lilly Medical Library; and  
Professor Emeritus, Department of  
Pediatrics; School of Medicine,  
Indiana University, and Research  
Scientist, Regenstrief Institute, 975  
West Walnut Street IB-310,  
Indianapolis, IN 46202-5121*

Received July 2011; accepted August 2011

## References

1. Association of Academic Health Sciences Libraries. Annual statistics of medical school libraries in the United States and Canada. 29th ed. Seattle, WA: The Association; 2007.
2. Association of Academic Health Sciences Libraries. Annual statistics of medical school libraries in the United States and Canada. 33rd ed. Seattle, WA: The Association; 2011.
3. Schlimgen JB, Kronenfeld MR. Update on inflation of journal prices: Brandon/Hill list journals and the scientific, technical, and medical publishing market. *J Med Lib Assoc.* 2004 Jul;92(3):307–14. Correction in: *J Med Lib Assoc.* 2004 Oct;92(4):506.
4. McGowan J. Tomorrow's academic health sciences library today. *J Med Lib Assoc.* 2012 Jan;100(1):43–6. DOI: <http://dx.doi.org/10.3163/1536-5050.100.1.008>.
5. Davidoff F, Florance V. The informationist: a new health profession? *Ann Intern Med.* 2000 Jun 20;132(12):996–8.
6. Lamb G. And now, "clinical librarians" on rounds [medical news]. *JAMA.* 1974 Oct 28;230(4):521.
7. Shipman JP, Cunningham DJ, Holst R, Watson LA. The informationist conference: report. *J Med Lib Assoc.* 2002 Oct;90(4):458–64.
8. Wolf DG, Chastain-Warheit CC, Easterby-Gannett S, Chayes MC, Long BA. Hospital librarianship in the United States: at the crossroads. *J Med Lib Assoc.* 2002 Jan;90(1):38–48.
9. Greenhalgh T, Hughes J, Humphrey C, Rogers S, Swinglehurst D, Martin P. Information in practice: a comparative case study of two models of a clinical informationist service. *BMJ.* 2002 Mar 2;324(7336):524–9.
10. Shearer BS, Seymour A, Capitani C. Bringing the best of medical librarianship to the patient team. *J Med Lib Assoc.* 2002 Jan;90(1):22–31.
11. Giuse NB, Koonce TY, Jerome RN, Cahall M, Sathe NA, Williams A. Evolution of a mature clinical informationist model. *J Am Med Inform Assoc.* 2005 May-Jun;12(3):249–55.
12. Rankin JA, Grefeheim SF, Canto CC. The emerging informationist specialty: a systematic review of the literature. *J Med Lib Assoc.* 2008 Jul;96(3):194–206. DOI: <http://dx.doi.org/10.3163/1536-5050.96.3.005>.
13. Homan JM, McGowan JJ. The Medical Library Association: promoting new roles for health information professionals. *J Med Lib Assoc.* 2002 Jan;90(1):80–5.
14. Kronenfeld M. Trends in academic health sciences libraries and their emergence as the "knowledge nexus" for their academic health centers. *J Med Lib Assoc.* 2005 Jan;93(1):32–9.
15. Medical Library Association. Competencies for lifelong learning and professional success: the educational policy statement of the Medical Library Association [Internet]. Chicago, IL: The Association [cited 25 Mar 2011]. <[http://www.mlanet.org/education/policy/executive\\_summary.html](http://www.mlanet.org/education/policy/executive_summary.html)>.
16. Lynn VA, FitzSimmons M, Robinson CK. Special report: symposium on transformational change in health sciences libraries: space, collections, and roles. *J Med Lib Assoc.* 2011 Jan;99(1):82–7. DOI: <http://dx.doi.org/10.3163/1536-5050.99.1.014>.
17. Lindberg DAB, Humphreys BL. 2015—the future of medical Libraries. *N Engl J Med.* 2005 Mar 17;352(11):1067–70.
18. Lee TH. Quiet in the library. *N Engl J Med.* 2005 Mar 17;352(11):1068.
19. Persily GL, Butter KA. Reinvisioning and redesigning "a library for the fifteenth through twenty-first centuries": a case study on loss of space from the Library and Center for Knowledge Management, University of California, San Francisco. *J Med Lib Assoc.* 2010 Jan;98(1):44–8. DOI: <http://dx.doi.org/10.3163/1536-5050.98.1.015>.
20. Tooey MJ. Renovated, repurposed, and still "one sweet library": a case study on loss of space from the Health Sciences and Human Services Library, University of Maryland, Baltimore. *J Med Lib Assoc.* 2010 Jan;98(1):40–3. DOI: <http://dx.doi.org/10.3163/1536-5050.98.1.014>.
21. Tobia RC, Feldman JD. Making lemonade from lemons: a case study on loss of space in the Dolph Briscoe, Jr. Library, University of Texas Health Sciences Center at San Antonio. *J Med Lib Assoc.* 2010 Jan;98(1):36–9. DOI: <http://dx.doi.org/10.3163/1536-5050.98.1.013>.
22. Haynes C. Integrating with users is one thing, but living with them? a case study on loss of space from the Medical Center Library, University of California, San Diego. *J Med Lib Assoc.* 2010 Jan;98(1):32–5. DOI: <http://dx.doi.org/10.3163/1536-5050.98.1.012>.
23. Freiburger G. A "white elephant" in the library: a case study on loss of space from the Arizona Health Sciences Library at the University of Arizona. *J Med Lib Assoc.* 2010 Jan;98(1):29–31. DOI: <http://dx.doi.org/10.3163/1536-5050.98.1.011>.
24. Thibodeau PL. When the library is located in prime real estate: a case study on the loss of space from the Duke University Medical Center Library and Archives. *J Med Lib Assoc.* 2010 Jan;98(1):25–8. DOI: <http://dx.doi.org/10.3163/1536-5050.98.1.010>.
25. Schwartz DG, Biobaum PM, Shipman JP, Markwell LG, Marshall JG. The health sciences librarians in medical education: a vital pathways project task force. *J Med Lib Assoc.* 2009 Oct;97(4):280–4. DOI: <http://dx.doi.org/10.3163/1536-5050.97.4.012>.
26. Robinson L, Hilger-Ellis J, Osborne L, Rowlands J, Smith JM, Weist A, Whetherly J, Phillips R. Healthcare librarians and learner support: a review of competencies and methods. *Health Inform Lib J.* 2005 Dec;22(suppl 2):42–50.
27. Lyon JA, Tennant MR, Messner KR, Osterbur DL. Carving a niche: establishing bioinformatics collaborations. *J Med Lib Assoc.* 2006 Jul;94(3):330–5.
28. Tennant MR, Miyamoto MM. The role of the medical librarian in the basic biological sciences: a case study in virology and evolution. *J Med Lib Assoc.* 2008 Oct;96(4):290–8. DOI: <http://dx.doi.org/10.3163/1536-5050.96.4.004>.
29. Ferree N, Schaefer N, Butson LC, Tennant MR. Liaison library tiers: levels of service. *J Med Lib Assoc.* 2009 Apr;97(2):145–8. DOI: <http://dx.doi.org/10.3163/1536-5050.97.2.015>.
30. Tennant MR, Cataldo TT, Sherwill-Navarro P, Jesano R. Evaluation of a

- liaison library program: client and liaison perspectives. *J Med Lib Assoc*. 2006 Oct;94(4):402–9, e201–4.
31. Obst O. The medical library of the future: be prepared for the invisible [Internet]. INFORUM 2005: 11th Conference on Professional Information Resources; Prague, Czech Republic; 24–26 May 2005 [cited 25 Mar 2011]. <[http://www.inforum.cz/pdf/2005/Obst\\_Oliver.pdf](http://www.inforum.cz/pdf/2005/Obst_Oliver.pdf)>.
32. Plutchak TS. T. Scott: future of librarians interview. *Collegeonline.org* [Internet]. [cited 25 Mar 2011]. <<http://www.collegeonline.org/library/librarians-online/t-scott/>>.
33. McLendon W. The trendiness of technology trends. *Med Lib Tech Trends* [Internet]. 2007 [cited 25 Mar 2011]. <<http://www.medlibtechtrends.wordpress.com>>.
34. Ríos G. Top 10 technology trends librarians should be conversant with. *Med Lib Tech Trends* [Internet]. 2007 [cited 25 Mar 2011]. <<http://www.medlibtechtrends.wordpress.com>>.
35. Dismukes J. How can medical libraries become more relevant in the age of digital information? *Lib Stud J* [Internet]. 2009 [cited 25 Mar 2011]. <<http://www.librarystudentjournal.org/index.php/lsj/article/view/120/237/>>.
36. Colaianni LA. Change is not made without inconvenience: becoming a knowledge manager. *Congreso Panamericano de Información en Ciencias de la Salud (CRICS) V Proceedings* [Internet]. 2001;5, [cited 25 Mar 2011]. <<http://crics5.bvsalud.org/proceedings/Colaianni/colaianni.htm>>.